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RECENT LITERATURE.

Botany in the Secondary Schools.¹—We have before us a most excellent guide to plant study, bearing the marks of faithful, conscientious effort from title page to finish. No one who has had experience in conducting courses in botany with college students will deny that a great deal of the instruction given in this science in secondary schools is loose, unscientific and crude to the last degree. Notwithstanding the recent attention given to this fact in scientific journals the evils have not yet by any means been entirely remedied. Indeed they frequently extend beyond the lower schools, even into the colleges and universities themselves.

The author of this Guide is well-known as a thoroughly successful botanical teacher of many years experience, and all the statements which he makes have been subjected to practical laboratory tests. Two things are to be especially guarded against in a manual of this kind: Telling the student too much, and giving too meagre assistance. In the latter case, either discouragement results or undue attention is paid to minor points while important matters are either entirely overlooked, or studied without reference to their proportionate significance. Some teachers in their eagerness to avoid the first blunder fall into the second which is even worse. Professor Spalding has, in most cases, satisfactorily avoided both errors.

The introduction contains timely suggestions to students and teachers, together with a well selected list of books of reference and laboratory material. We wish, however, to take emphatic exception to the statement that "in every case the pupil is to be provided with the material used." One of the principal objects in the study of any natural science should be to encourage the student to become acquainted with nature in its broadest sense, a knowledge to be obtained only by personal exploration in woods and fields. As has been previously pointed out in various journals the modern tendency of scientific study is to lose sight of the naturalist in the almost exclusive attention given to laboratory work. The benefit to be gained from the study of a flower or plant brought by the teacher to his classes is one-sided and very incomplete, and should by all means be supplemented by the personal investiga-

¹ Guide to the Study of Common Plants, an Introduction to Botany. Volney M. Spalding, Professor of Botany in the University of Michigan. Second edition, xxiii, 294 pp. Published by D. C. Heath & Co., Boston, 90 cents, postpaid.

tions of the students in its native habitat. As a matter of fact, however, the author does not adhere strictly to the advice above given but generally takes it for granted that the plant has also been observed while growing.

Chapters are given on seeds, germination, the root, stem, leaf, flower and fruit. Then the so-called flowerless plants are taken up, and the sea weeds and their allies, molds and rusts, mosses and liverworts, ferns and horsetails are studied. The conifers and leading families of monocotyledons and dicotyledons follow in their natural order.

Each chapter begins with a list of material needed for study, contains minute and practical directions to the student and closes with an admirable summary. Copious references to the literature of the subjects are given in foot notes. One of the most valuable features of the work are the numerous questions asked and the special topics for study which the author suggests under each group. Simple physiological experiments, such as any student working alone, or teacher even in our district schools can easily perform, are described. Such subjects as seed dispersion and protection, fertilization, assimilation, respiration, and transpiration, adaptation of various plant organs to their environment as well as plant relationships are treated in a fresh and interesting manner quite different from the ordinary laboratory guides.

When one considers the great diversity and looseness of terminology employed by many prominent botanical writers, the difficulty as well as the necessity is apparent of having accurate definitions and plant descriptions. The glossary at the close of Professor Spalding's Guide is most commendable, and constitutes one of the many admirable characters of work which we heartily commend to all lovers of plant life. Not only secondary schools, but also students working by themselves will find it exceedingly helpful. We know of nothing better adapted to the short winter courses given by some of our Agricultural Colleges, and for use in University Extension instruction.

GILBERT H. HICKS.

The New Check-List of Plants.²—The recent considerable changes in botanical nomenclature have made necessary such a book as the one here noticed. We have had in various monographs and scattered notes in botanical journals so many records of changes, and notices of others which should be made, that any one doing critical work has been compelled to make a catalogue for himself, or lose much time whenever he worked over a new lot of species. One does not have to subscribe to everything done by the committee to feel that the